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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/716,136 | 11/18/2003 | Jaishankar Moothedath Menon | ARC920030069US1 | 7019 |
| 55508 | 7590 | 07/17/2006 | | |
| JOSEPH P. CURTIN, L.L.C. 1469 N.W. MORGAN LANE PORTLAND, OR 97229-5291 | | | EXAMINER KO, DANIEL BOKMIN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2189 | |

DATE MAILED: 07/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/716,136 | Applicant(s) MENON ET AL. | |
| | Examiner Daniel B. Ko | Art Unit 2189 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is responsive to the Amendment filed on 4/26/2006.

Any objections and rejections from the prior correspondence not restated in this communication is/are withdrawn.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 16-29 are directed to non-statutory subject matter, because a data structure per se is not patentable under 35 USC 101.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 16, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi.

Regarding claims 1, 16, and 30, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (paragraph 44) with c redundancy information sectors (paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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3. Claims 3, 8-9, 13-15, 18, 23-24, 28-29, 32, 37-38, 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi, in view of Kaneda et al. (US Patent 5,958,067), hereinafter simply Kaneda.

Regarding claims 3, 18, and 32, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (paragraph 44) with c redundancy information sectors (paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi fails to teach the RAID-configured storage system is configured as a RAID 5 storage system. Kaneda teaches a method, wherein the RAID-configured storage system is configured as a RAID 5 storage system (column 1, lines 34-62). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Servi with Kaneda. The motivation for doing so would have been an improved response performance and throughput (column 3, lines 51-56).

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Regarding claims 8, 23, and 37, Kaneda teaches a method, wherein the redundancy information is an XOR-based code (column 11, lines 6-23).

Regarding claims 9, 24, and 38, Kaneda teaches a method, wherein the redundancy information is a one-dimensional parity (column 9, lines 24-33).

Regarding claims 13, 28, and 42, Kaneda teaches a method, wherein the n data information sectors and the c redundancy information sectors are written consecutively (Fig. 1, Disk 301, Kaneda shows the Data Area 391 and Parity Area 392 are written consecutively).

Regarding claims 14, 29, and 43, Kaneda teaches a method, wherein the n data information sectors and the c redundancy information sectors are intermingled when written (Fig. 5, Disk 301, Kaneda shows the Data Area 391 and Parity Area 392 are intermingled when written).

Regarding claim 15, Kaneda teaches a method, further comprising:
receiving n data information sectors (Fig. 1, Data Area 391; column 7, lines 3-16); and
generating c redundant information sectors (Fig. 1, Parity Area 392; column 7, lines 3-16).

4. Claims 2, 4-7, 10-12, 17, 19-22, 25-27, 31, 33-36, 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi, in view of Hetzler et al. (US Patent Application 2005/0015700), hereinafter simply Hetzler.

Regarding claims 2, 17, and 31, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (paragraph 44) with c redundancy information sectors (paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi fails to teach the RAID-configured storage system is configured as a RAID 6 storage system. Hetzler teaches a method, wherein the RAID-configured storage system is configured as a RAID 6 storage system (Paragraph 34). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Servi with Hetzler. The motivation for doing so would have been an improved performance, protection and efficiency (See Hetzler, paragraph 20).

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Regarding claims 4, 19, and 33, Hetzler teaches a method, wherein the RAID-configured storage system is configured as a RAID 51 storage system (paragraph 35).

Regarding claims 5, 20, and 34, Hetzler teaches a method, wherein the RAID-configured storage system is configured as a RAID 3+3 storage system (paragraphs 27 and 30).

Regarding claims 6, 21, and 35, Hetzler teaches a method, wherein the RAID-configured storage system is configured as a RAID N+3 storage system (paragraph 34).

Regarding claims 7, 22, and 36, Hetzler teaches a method, wherein the redundancy information is based on a Reed-Solomon code (paragraph 21 and 31).

Regarding claims 10, 25, and 39, Hetzler teaches a method, wherein the storage unit is a hard disk drive (paragraph 27).

Regarding claims 11, 26, and 40, Hetzler teaches a method, wherein the storage unit is an optical drive (paragraph 27).

Regarding claims 12, 27, and 41, Hetzler teaches a method, wherein the storage unit is a random access memory (paragraph 27).

Response to Arguments


Applicant's arguments with respect to claims 1-43 have been considered but are moot in view of the new ground(s) of rejection.

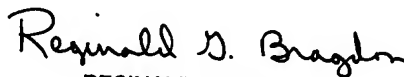
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel B. Ko whose telephone number is 571-272-8194.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald G. Bragdon can be reached on 571-272-4204. The fax phone number for the organization where this application or proceeding is assigned is 703-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Daniel B. Ko
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